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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/781,787	02/12/2001	Martin Stanton	102282-0008	6971

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EXAMINER

THOMAS, COURTNEY D

ART UNIT	PAPER NUMBER
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2882

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/781,787

Applicant(s)

STANTON ET AL.

Examiner

Courtney Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 and 35-43 is/are pending in the application.
- 4a) Of the above claim(s) 1-19 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-27, 42 and 43 is/are allowed.
- 6) ☒ Claim(s) 35-37 and 39 is/are rejected.
- 7) ☒ Claim(s) 38, 40 and 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. This application contains claims 1-19 drawn to an invention nonelected with traverse in Paper No. 9. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Specification

2. The disclosure is objected to because of the following informalities:

3. Pending application 09/298,381 (cited on p. 7, 3rd paragraph and p. 19, 2nd paragraph) is now U.S. Patent No. 6,448,544. This change should be updated in the disclosure.

4. The equation written on p. 17, 2nd paragraph is ambiguous since the use of "□" is undefined.

5. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

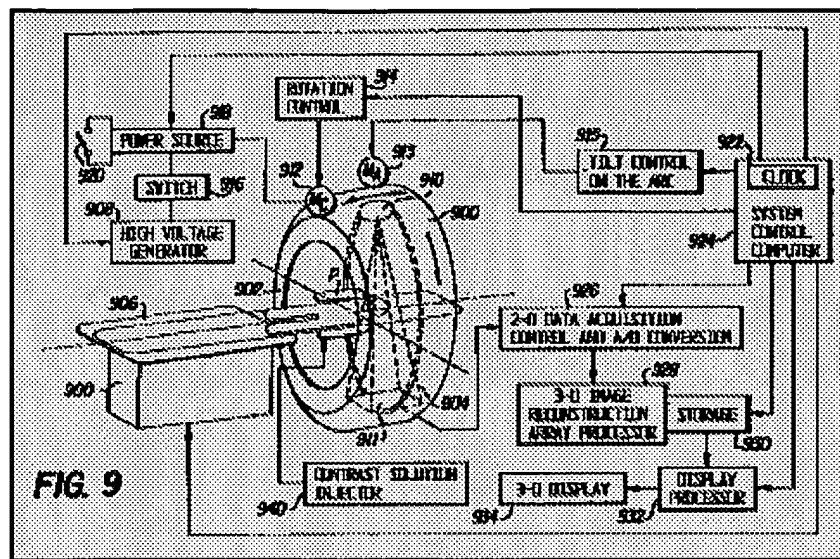
6. Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 35-37, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ning et al. (U.S. Patent 5,999,587) in view of Klotz et al. (U.S. Patent 5,852,646).



[57]

ABSTRACT

A method of and system for the 3-D reconstruction of an image from 2-D cone-beam tomography projections is disclosed in which a circle-plus-arc data acquisition geometry is utilized to provide a complete set of data so that an exact 3-D reconstruction is obtained. A volume CT scanner which

Figure 9 & Abstract – U.S. Patent 5,999,587 to Ning et al.

11. As per claims 35 and 39, Ning et al. disclose a method comprising the steps of:
12. a) irradiating a scene from a plurality of angular positions (via source 910)
13. b) detecting radiation transmitted through the scene (via detector 911) at a plurality of angular positions
14. c) producing two-dimensional transmission data representative of the intensity of the radiation transmitted through the scene at each of the plurality of angular positions and producing a three-dimensional image of the scene (via image processing units 926, 928, 930, 932 and 934 - see abstract and Fig. 9, above).

15. Ning et al. do not explicitly disclose a method comprising the step of irradiating an object from a plurality of non-uniformly distributed angular positions.

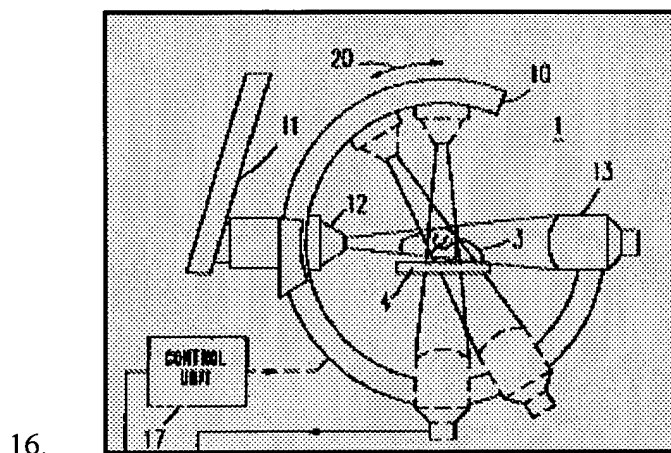


Figure 1 - U.S. Patent 5,852,646 to Klotz et al.

17. Klotz et al. suggest that non-uniformly distributed positional irradiations of an object are sufficient for obtaining slice information useful for image generation and further suggest that it is the number of acquisitions that result in the formation of accurate volumetric data (see Fig. 1 above, abstract and column 4, lines 40-55).

18. It would have been obvious to modify the method of Ning et al. such that it incorporated the step of irradiating an object from a plurality of non-uniformly distributed angular positions. One would have been motivated to make such a modification so that radiation capture results in image sets that can be used for the formation of volumetric data as suggested by Klotz et al. (see Fig. 1 above, abstract and column 4, lines 40-55).

19. **As per claim 36**, Ning et al. as modified, disclose a method comprising the steps of irradiating a scene with x-ray radiation; wherein the plurality of angular positions forms an arc about the scene (abstract, Fig. 9 above).

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20. **As per claim 37**, Ning et al. as modified, do not explicitly disclose a method wherein the total radiation dose is less than or equal to a dose of a standard screening mammogram.

21. It would have been obvious to further modify the method and system of Ning et al. such that the source produces a total radiation dose less than or equal to a dose of a standard screening mammogram. One would have been motivated to make such a modification so that radiation energy is sufficient to obtain attenuation data of a portion of a patient, while maintaining a radiation exposure level that does not potentially damage the living tissues of a patient. Examiner notes this modification would be well within the skill level of a practicing radiologist or physician, and is considered to be an obvious design choice commensurate with an intended anatomical investigation.

Allowable Subject Matter

22. Claims 20-27, 42 and 43 are allowed.

23. The following is a statement of reasons for the indication of allowable subject matter:

24. As per claims 20, 42 and 43 and dependent claims 21-27, the examiner found no reference in the prior art that disclosed or made obvious a method comprising the step of detecting radiation transmitted through an object at angular positions at different spatial resolutions to create a two-dimensional radiation transmission data as recited in independent claims 20, 42 and 43.

25. Claims 38, 40 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

26. The following is a statement of reasons for the indication of allowable subject matter:

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27. As per claim 38, the examiner found no reference in the prior art that disclosed or made obvious a method comprising the step of irradiating an object with a first radiation dose at one angular position of the source and irradiating the object with a second radiation dose at another angular position, the second radiation dose being different from the first radiation dose.

28. As per claims 40 and 41, the examiner found no reference in the prior art that disclosed or made obvious a method comprising the step of selecting a sufficiently low dose of radiation for each angular irradiation such that a total dose of radiation per three-dimensional image is approximately 80 mrad.

Conclusion

29. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (703) 306-0473. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308 4858. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Courtney Thomas



DAVID V. BRUCE
PRIMARY EXAMINER